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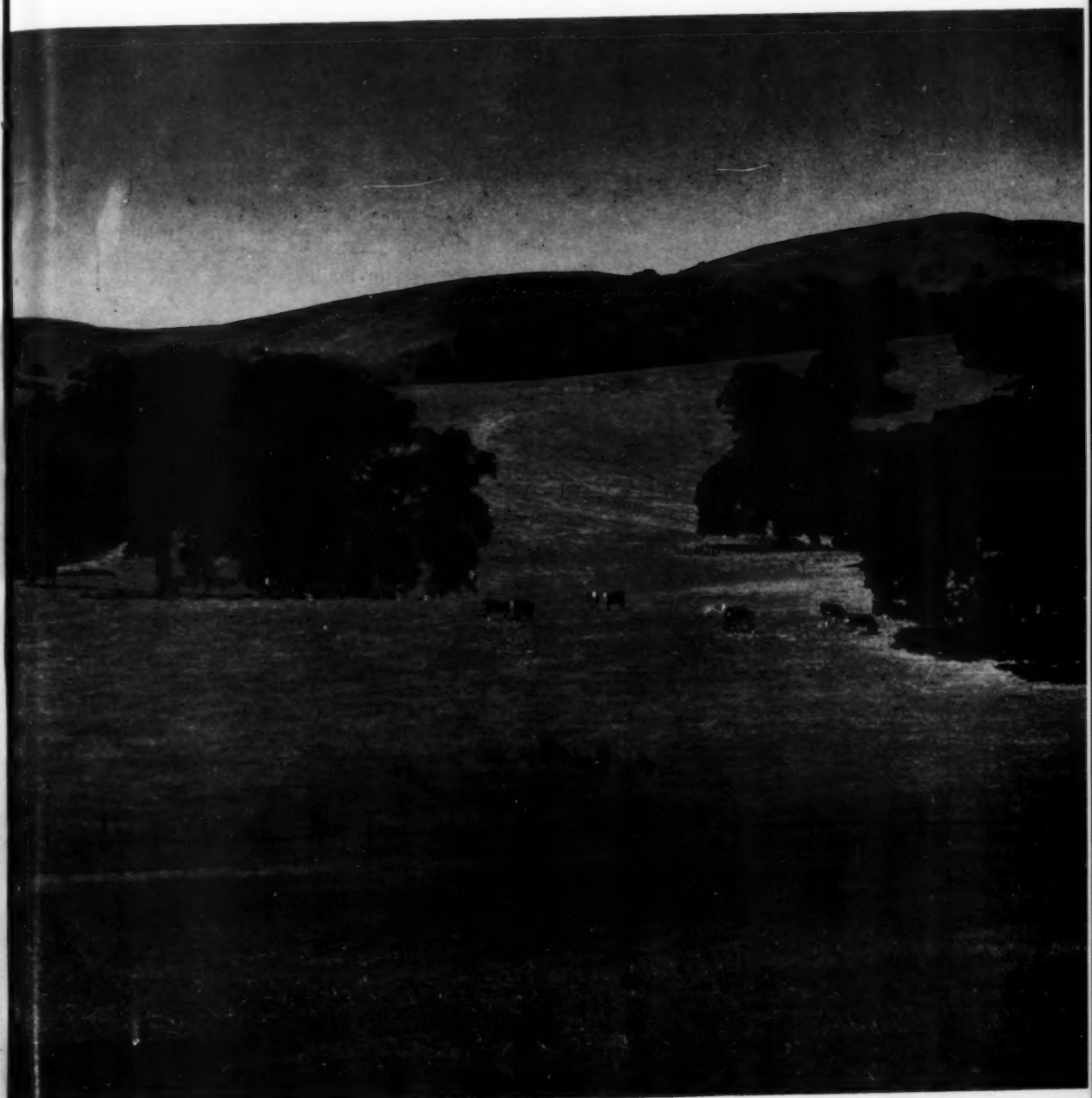
Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

VOL. XXV, NO. 10 MAY 1960

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It were happy if we studied nature more in natural things; and act according to nature, whose rules are few, plain and most reasonable.

—WILLIAM PENN

COVER PICTURE.—A well-managed range in the Contra Costa Soil Conservation District, California.

Soil Conservation

EZRA TAFT BENSON
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, June 26, 1958.

TOM DALE, Editor

15 CENTS PER COPY $1.50 PER YEAR

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All orders for paid subscriptions go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

John Wayne and Conservation Ranchers Provide

Realism for Davey Crockett

in his adventures at the Alamo

By Meril G. Carter

TEXAS' epic battle for independence is the subject of a new John Wayne movie, "The Alamo," to be released in the fall of 1960. The locale for shooting the movie is the rough prairie country along the Rio Grande River in southwest Texas, centering around the old town of Brackettville.

Wayne's insistence on realism in his movies led to a new alliance between the movie industry and conservationists.

Most of us have been conditioned to viewing vast areas of grassless plains, eroded arroyos, and dust storms in our western movies. Yet, the historical evidence points to abundant grass, clear streams, and herds of wild animals existing in the early days of the Southwest.

The vast amount of research done by Wayne prior to the filming of the movie convinced him that the true story of the early days of Texas and the "Alamo" took place in a "sea of grass." In searching for a location similar to the vicinity of old San Antonio and the Alamo mission, Wayne chose the 22,000-acre ranch owned by "Happy" Shahan, well-known Angus breeder and conservationist of Kinney County.

Note.—The author is area conservationist, Soil Conservation Service, Uvalde, Tex.

John Wayne and fellow actors portraying Davey Crockett and his Tennesseeans as they rode through a "sea of grass" on their way to the Alamo.

Buster Lindley, SCS technician, in reseeded grass on the Shahan ranch with a replica of the Alamo in the background.

Exact replicas of the town of San Antonio and the Alamo mission compound, as they were in 1836, were constructed from adobe brick and native stone. Unfortunately, the site of the main battle and cavalry charges was a bare, eroded hillside. Happy Shahan, with technical advice from "Buster" Lindley, SCS technician, succeeded in regrassing the site in time for the movie shots.

But this still didn't solve all of Wayne's problems.

His desire for realism called for a limitless expanse of tall grass as the background for the scenes showing Davy Crockett's first glimpse of Texas as he rode to his destiny at the Alamo. He repeatedly complained about not being able to find a large enough area of tall grass to represent the plains of early Texas.

Fortunately, Wayne mentioned this problem to a neighboring rancher, W. L. (Bill) Moody IV. It just happened that Bill had worked for several years carrying out his conservation plan with the West Nueces-Las Moras Soil Conservation District. This plan called for restoration of his ranch from a wilderness of thorny brush and cactus to its former pristine condition of lush grasses grazed by cattle and deer.

SCS technicians inspect brush and weeds on the Tequesquite Ranch before clearing and seeding operations.

Bill Moody prevailed on Wayne to look at his ranch. One look at Moody's Tequesquite Ranch convinced Wayne that his search was over.

Buster Lindley helped cinch the decision when he remarked to Wayne and his head cameraman that he "was waiting to see an historical movie of the Southwest showing beautiful plains of grass as they actually existed, rather than a bare, eroded landscape."

The grass on Moody's ranch did not come about overnight or by accident. Moody began his long-range conservation program in 1952, when he started managing his own ranch and 125,000 acres of land for the Moody Foundation. When the West Nueces-Las Moras Soil Conservation District was organized in 1955, Moody soon developed and began carrying out a plan based on the needs of the soils and vegetation. His longtime goal is to have every acre of land pro-

Bill Moody (center) and neighbors in reseeded range on the Tequesquite Ranch where scrub brush, weeds, and cactus were the principal plants a few years ago.

duce as it did in its original condition. Among the measures called for in his plan are brush eradication followed by reseeding and deferred grazing.

Once the grass is re-established, he uses the grass moderately to promote growth and vigor. He has constructed ponds so that the livestock can graze the grass more uniformly. Wildlife has benefited greatly from the increased growth of grass and from small areas of brush left for their protection. Since 1956 Bill has completely restored 9,000 acres of depleted rangeland by brush control and reseeding. The entire ranch is being improved by deferred grazing and proper use.

Ranchers throughout southwest Texas are looking forward to seeing "The Alamo" with its scenes of pioneer Texas and the "sea of grass." And "The Alamo" may set a precedent for realism in movies of the Southwest. Perhaps herds of cattle and charging horsemen will no longer be set in a scene of grassless desolation, where neither man nor animal could exist, but in a natural environment of lifegiving grass and clear streams.

Meril G. Carter, SCS technician, views reseeded grass on the Shahan ranch with the replica of old San Antonio in the background.

Striving for efficient beef production—

Conservation Range Management

was the answer for a New Mexico rancher

By Herbert I. Jones and L. J. Walpole

THE principal target for rancher J. C. Neafus has always been the most efficient beef production he could get. In striving for this goal, he has accomplished something else—one of the best examples of conservation range management you'll find anywhere in the Southwest Plains.

Neafus runs a 40-section spread near Newkirk, New Mexico, that is noted for its topflight Hereford herd sires.

Here is a box score of some of his conservation accomplishments: 1,000 dams and diversion dikes built; adoption of specifie grass management for every pasture; Pinon-Juniper clearing of 1,200 acres; complete gully control on two major drainages; 2,000 acres of waterspreading for hay production; contour furrowing of several thousand acres of "tight" land; and seeding of all abandoned cropland and reseeding of rangeland "spots."

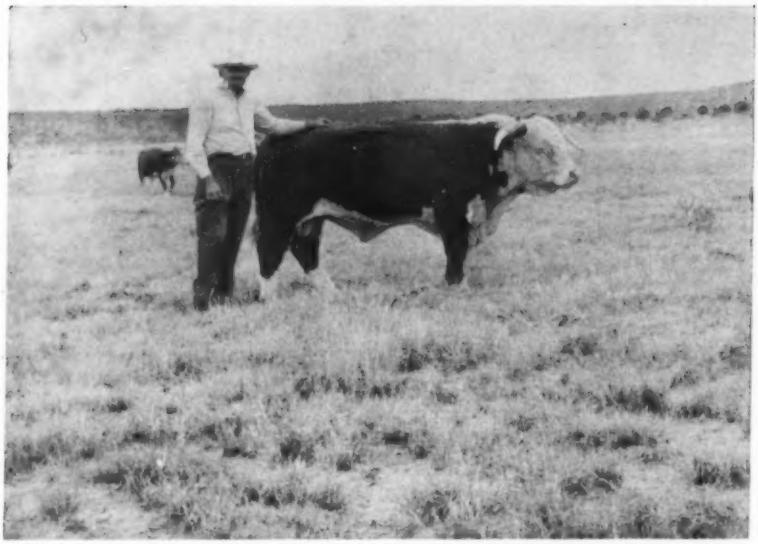
In the process, Neafus has integrated 100 separate tracts, many of them plow lands, to form the balanced ranch unit he now operates. Gradually, over a period of 25 years, he has worked each property into his scheme as he has the 8,000 acres of range he leases.

Neafus often remarks that he wouldn't have had the courage to tackle all the tracts at one time. It's a good thing for conservation and for the community that he was able to work man-sized pieces.

Current ranch plans call for additional waterspreading, reseeding, and brush eradication—vertical expansion.

Cliff Neafus' story won't end with anything short of A-1 production efficiency—but it didn't begin that way. Cliff came to the northeast New Mexico territory as a boy when his father homesteaded

Note:—The authors are, respectively, information specialist, Denver, Colo., and work unit conservationist, Santa Rosa, N. Mex., both of the Soil Conservation Service.



J. C. Neafus and one of his herd bulls in a well-managed blue grama pasture.

160 acres in 1901. There were paying crops in some of the early farming years, but more often there were none. Cliff's first years were marked by the loss of neighbors and friends who moved away as they were gradually convinced that it was rangeland after all. The few families who stayed learned that ranching could provide a good life. The land asked in return work and management—above all, management.

Cliff Neafus is the kind of man who is both a manager and a worker. He is spending a lifetime helping nature correct the mistakes of forgotten settlers. Grass is his healing potion—water control makes the grass grow.

Neafus feels there can be no substitute for range feed, that good grass management coupled with practices that make the best use of rainfall is the key to a successful livestock operation. How well his beliefs have paid off is shown by the 500-pound range calves he markets each fall, by his replacement heifer herd, and by the 75 selected bull calves he readies for service each year.

Neafus pioneered many of the conservation practices that he and most ranchers take for granted today. Some of the first erosion-control waterspreading dams to be built in the West were built by Cliff Neafus more than 25 years ago.

As a result of his early interest and work Neafus became a "booster" for the conservation way of soil, water, and grass management.

Currently, Neafus is operating with a Great Plains Conservation Program plan which is a refinement of his longstanding ranch plans with the Guadalupe Soil Conservation District. He has participated in the Agricultural Conservation Program for many years and was one of the county's original ACP committeemen.

Area Conservationist Herb Cavett terms Cliff's work one of the top development jobs in the region. Cliff scoffs at that compliment when he is asked about it, but adds that he would welcome any rancher to his place to swap ideas.

If you take up Neafus' offer you may see him working cattle and perhaps shaping up the top half of his registered bull calves. You

A gully on the Neafus ranch from which runoff water has been diverted while grass heals the erosion scars.

Lush grass in an area where one of Neafus' waterspreading structures empties runoff from a nearby ridge.

may see native grass seed harvesting, haying, or perhaps some planting or dirt work—depending on the season.

No matter when you visit the ranch, the waterspreading systems Neafus has built over the past 25 years will catch your eye.

All over the ranch are hundreds of dams, diversions, dikes, and ditches built with the idea of spreading channeled runoff. The result: 2,000 acres get extra water and 1,000 tons or more of native hay is laid by—just in case. So lush is the hay crop that Neafus finds it more convenient to let a neighbor have half the crop just to put up his share than to bother with his own equipment. Even so, there is a lot left standing. Neafus uses the hay and only a small amount of cottonseed cake to condition his stock and to carry them through the winter.

That his grass management has done its job, conservation-wise, can best be pointed out by examining the few remaining gully cuts that were once the pattern of the land rather than the exception.

Neafus points out that his conservation practices, including the waterspreading, have cost him around $30,000, with cost-sharing from the Federal Government nearly matching this amount. Spread over 25 years, it has meant an annual cost per acre of around 12 cents—little enough, he adds, compared to the grass reward.

Two of the most expensive jobs Neafus has done are spot-hay mulching and chain brush control. The former is running as high as $25 per acre as Neafus seeks to "hair-over" pocks of the six-year drought.

The Pinon-Juniper removal work done with a local contractor's heavy crawlers and a 600-foot anchor chain has brought a 90-percent kill of the scrub trees, and seedlings of blue and sideoats grama have already popped up following the hand seeding of last spring.

The lengths to which Neafus will go to produce range grass are pointed up wherever you go on the 28,000-acre spread. And, nothing delights Cliff Neafus and his wife Claire more than to show their handiwork to visitors.

Whether that visit is for an hour or a whole day, whether you see one or many of the ranch's interesting facets, you'll come away with Cliff Neafus' words indelibly etched on your mind: "To the cattleman, there is no substitute for range feed—and soil, water, and grass management will get you that feed."

Nematode control in soybeans

Crop rotation seems to be the most practical method now known for controlling the spread of soybean cyst nematodes in Illinois, according to M. P. Britton, plant pathologist at the University of Illinois. He explains that most crops commonly grown in Corn Belt rotations are resistant to the nematodes. Hence, if such crops as corn, small grains, and hay are grown in rotation with soybeans the nematode damage should be greatly reduced. Experimental work is now underway to determine the best rotations to use against the nematodes.

The nematode, which can cause severe losses in soybeans, has a stronghold in Tennessee, Missouri, Arkansas, and other nearby States. Indications are that it's marching northward. It turned up in the southern tip of Illinois late last summer.

The cyst nematode spreads with bewildering ease. The eggs are well protected within cysts that can be carried by farm implements, tools, shoes, boxes, crates—almost anything that touches an infected soil. Wind, runoff water, and wildlife are also carriers.

Britton said that controlling spread of the nematode depends on recognizing symptoms of its presence in soybeans. Although positive identification isn't easy, he said farmers should watch for stunted plants. In soils of low fertility these pants may turn yellow. The infection shows up in patches in which all plants are affected. Stunting and yellowing from water damage look very much like nematode injury.

Weed control in the rotation program will also be important. Several weeds are known nematode hosts and definitely contribute to its spread.

Soil fumigation has proved too expensive so far but is still being studied in heavily infested areas.

◆

Farm stocks of feed grains on January 1 were six percent higher than the 1959 record.

An Important 25th Anniversary

By D. A. Williams

ON April 27, 1935, Public Law No. 46 of the 74th Congress was signed by the President. This law declared soil and water conservation on farm, grazing, and forest lands to be a permanent policy of Congress and directed the Secretary of Agriculture to establish a permanent agency in the Department of Agriculture to carry out the purpose of the act. The Secretary of Agriculture named that agency "The Soil Conservation Service." Hence, April 27, 1960, may rightfully be called the "Silver Anniversary" of the Soil Conservation Service.

Soil conservation experiment stations had been started at various locations over the country in 1929, as a result of congressional action that year. The Soil Erosion Service was created as an emergency agency in the Department of the Interior in September 1933 and transferred to the Department of Agriculture in March 1935. These preliminary steps set the stage; but not until the enactment of Public 46 was a national policy declared and the SCS born.

At the time the Soil Conservation Service was created, erosion control demonstration areas were already underway in a number of small watersheds and problem areas as a part of the program of the Soil Erosion Service. Soon thereafter a large number of CCC camps were transferred to SCS for technical administration, and many other demonstration areas were created.

Note:—The author is Administrator, Soil Conservation Service, Washington, D. C.

In 1937 many of the States passed laws permitting the creation of local soil conservation districts: in ensuing years, all States passed such laws. Since that time the Soil Conservation Service has carried out its designated objectives mainly by working with these locally governed soil conservation districts.

Since 1935 SCS has administered or helped administer several related programs aimed at better land use and soil and water conservation. Some of the more significant programs in which the Service has participated are: The flood prevention program, authorized by the Omnibus Food Control Act of 1936, with later amendments; the water facilities program, authorized by the Pope-Jones Act of 1937; the land utilization program, authorized by the Bankhead-Jones Farm Tenant Act of 1937; the shelterbelt program for the Great Plains, authorized by the Norris-Doxey Act of 1937; the small watershed protection program, as authorized by the Watershed Protection and Flood Prevention Act of 1954; and the Great Plains Conservation Program, as authorized by Public Law 1021, in 1956. Yet, the basic authority for most of the conservation work the Service has been and still is doing is Public 46.

Emphasis on different phases of the overall program has varied from time to time as public opinion or Congressional authorization pointed up specific needs. Conservation techniques have improved greatly over the years. There have been many changes in the personnel of the Service during this time. There have been several reorganizations of Service administration. Yet, there has been a surprising continuity in the program as a whole.

Many of those who were on the original staff are still with the Service. Only three men have served as chief administrators of SCS during the 25-year period: Hugh H. Bennett, Robert M. Salter, and myself. More important is the fact that the Service's basic objectives have undergone little change and the initial concepts on which the program was originally based are still valid. The concept that land varies from field to field and that it can be classified as to its capability and needs and so used and treated is still valid and is a basic premise on which all Service programs rest. The idea of treating entire farms and entire watersheds as units is still valid. The assumption that soil conservation and water conservation are inseparable phases of one program still holds. These and other basic principles were the foundation stones of the early programs of the Service and still serve as such.

In the next 25 years, techniques may change or be improved. Personnel will change. New problems, new needs, and new programs will develop. But, the basic objectives and the basic concepts will still add up to better use of land and water for better living for everyone. They probably will stand the further tests of time.

Chief Administrators, Soil Conservation Service, 1935-1960.

Hugh H. Bennett, 1935-51

Robert M. Salter, 1951-53

Donald A. Williams, 1953-

Reshaping a Farm

By Neal S. Bue

EARTH moved by the Meyers Brothers Livestock Company in Idaho's Yellowstone Soil Conservation District during landshaping operations on their 480-acre livestock farm would make a pile one acre square and 90 feet high.

That would be equivalent to a 4-story building on a city square block. But that is only part of the story. With livestock, well-planned rotations, and smart management the Meyers brothers have made an outstanding success of building a productive farm out of what was once considered marginal land.

The land shaping program has been dependent on a stock feeding program. As Marvin Meyers puts it, "The leveling could not have been carried out without the stock feeding program."

One must look at the aerial photographs taken in 1941 and again in 1951 to see the change that has taken place in field pattern.

When Marvin and Wayne bought the place in 1942, it was cut up into 40 or 50 separate small fields with alternate gravelly ridges and swampy low spots that grew only willows and cattails. The brothers knew that their first job was to get the land in physical shape for more efficient irrigation with larger and more uniform fields and less waste areas.

The next step would be to rebuild the soil itself. Because Wayne and Marvin had been brought up just across the road, they knew what the land would need—leveling, a crop rotation plan, and a livestock program.

The Yellowstone Soil Conservation District was organized in 1945. The following year, upon request from the Meyers brothers for assistance, SCS technicians working

Aerial photo of the 480-acre Meyers farm: (above) as it looked in 1941, (below) as it looked in 1951.

Note:—The author is work unit conservationst, Soil Conservation Service, St. Anthony, Idaho.

Land shaping operations on the Meyers farm.

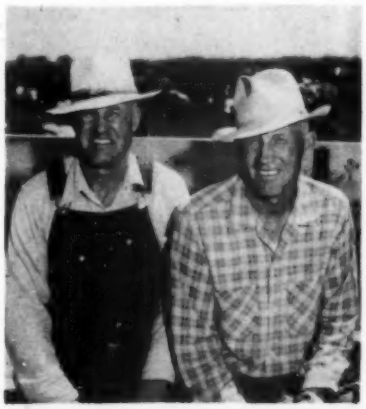
with the Yellowstone district helped them work out a conservation plan for the farm based on proper land use, crop rotation, fertilizing, and irrigation.

In 1946, with the help of SCS technicians and with cost-sharing provided by the Agricultural Conservation Program, a plan for reshaping the land surface and reorganizing the irrigation system was started. A canal running across one end of the place was relocated along the north and west boundary of the farm. The Meyers brothers also bought their own land shaping equipment—a crawler tractor and an eight-yard scraper—and started an intensive leveling program.

Because of the gravelly and porous soil, surface irrigation was unsuccessful. Marvin and Wayne changed to sub-irrigation, which is particularly suitable in their area because a layer of impervious lava underlying the valley floor keeps the water table high. By properly spacing sub-irrigation ditches it is possible to control the height of the water table.

The brothers have reshaped the entire farm once and now are going over it for the second time to get a uniform designed grade. Marvin says, "The second time over in leveling really pays, in both irrigation water management and crop production." When the farm is shaped for the second time they will have moved somewhere between 800 and 1,000 cubic yards per acre.

They have found that in heavy fills a layer of coarse sand and gravel should be placed at the bottom of a fill. This helps to prevent restriction of the upward movement of the sub-irrigation water.



Marvin (left) and Wayne Meyers with one of their livestock feeding pens in the background.

After a field has been shaped, it is subsoiled to a depth of about 18 inches and then is used as a feed lot. The brothers feed about 2,500 cattle and 15,000 lambs each winter. The feeding pens are about 200 by 250 feet in size and constructed in movable sections. Each pen has its own feed bunks and water troughs on skids. About 1,000 lambs or 125 to 150 steers are placed in each pen. The pens are moved about every 10 days. An obvious advantage of this system is

Cattle feeding pens on the Meyers farm.

that the lambs and steers spread the manure quite evenly. Two men can handle 7,000 to 8,000 lambs or 800 to 1,000 steers at a time by this feeding method.

The rest of the fertilizing program and the crop rotation is then carried out. The fertilizing program consists of the application of 30 tons of manure per acre from their feeding program every other year. Approximately 200 pounds of 33-percent commercial nitrogen per acre is applied on wheat and corn. Phosphate is used on alfalfa, and a mixture of nitrogen and phosphate on the pastures.

The seven-year rotation includes a new hay seeding with small grain, three years in hay followed by wheat, corn for silage, and beets. Then they go back to the hay seeding.

As a result of this land leveling, stock feeding, crop rotation, and fertilizing program, the Meyers' farm now looks like a tabletop. About 125 acres that once were ditches, wet swales, and dry knolls have been reclaimed for cropland or good pasture.

Crop yields have almost doubled. The usual yields per acre now are 75 bushels of wheat, 25 tons of corn silage, 20 tons of beets, and 4 tons of hay.

Furthermore, irrigation efficiency has been greatly increased. One man can now irrigate the farm efficiently, whereas formerly two or three men could not irrigate all of the farm properly.

TESTING DEBRIS GUARDS FOR PIPE SPILLWAYS

By W. R. Gwinn and W. O. Ree

DETENTION reservoirs are key structures in the current flood prevention program. Release of the flood waters these structures temporarily impound must be done at predetermined rates so the streams below will not flood. Pipe spillways of proper size and form can automatically hold the release rates to the desired maximums. When floating debris and trash are present in the flow, however, the pipe spillway can become clogged and fail to perform as designed.

The trash problem has been particularly vexing to conservation engineers. With little more than intution and imagination to guide them SCS engineers have produced a variety of designs for guards to keep the trash from pipe entrances. Some of these guards have worked well, while others have been inadequate. Those that worked have been in some cases unneccessarily complicated and expensive.

To help find the "best" trash guard, studies have begun at the Stillwater Outdoor Hydraulic Laboratory of the Agricultural Research Service in cooperation with the Oklahoma Agricultural Experiment Station. The exploratory tests of the research engineers tell a story of patience, persistence, and ingenuity which should be of interest to conservationists.

Briefly stated, an adequate guard is one that will stop the trash that will not go through the pipe and pass the trash that will. Also, the guard—trash-laden or clean—should not adversely affect the capacity of the pipe spillway, nor should it be unduly complicated in form or too expensive to build. This describes the goal of the experimenter. His next step was to plan a research program to reach his objective.

It was decided to base the research program largely on the testing of small models in an indoor laboratory. This would allow a large number of types to be tested thoroughly, without the undue waste of water required for outdoor testing of full-scale models.

With clear-water tests, similarity between a model and the prototype was not too difficult to achieve, but when trash was introduced into the flow the similarity was lost. Since the value of the model tests would depend on similarity, special tests were needed to determine the relationship between model trash tests and full-size structure trash tests. So the first tests were made on a full-size pipe spillway with a trash-laden flow.

Note:—The authors are hydraulic engineers, Agricultural Research Service, Stillwater, Okla.

No. 54

This is the fifty-fourth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

The spillway used was already available on the hydraulic laboratory grounds. It consisted of a 24-inch concrete pipe through a small earth-fill dam. The square drop-inlet riser was rebuilt to conform with a design then current in the south central States. A trash guard, also patterned on existing designs, was installed on this riser.

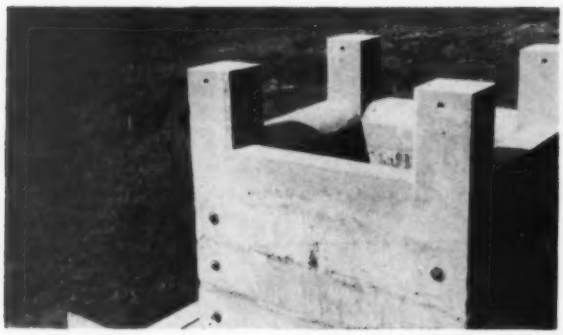
A test flow was run into the head pool at the entrance to the pipe spillway. A trash load of 8 pickup-truck loads of lovegrass hay was tossed into the pool. This provided a severe and realistic test. After 22 hours of pipe flow the hay had gathered about the inlet and flow capacity had been reduced to about 50 percent. In other words, the pipe spillway could now discharge at only one-half its capacity rate because of clogging of the trash rack bars. These tests pointed out immediately the need for a more efficient trash guard. They also provided the data for a comparison of model tests with full-size structure tests.

The model studies were undertaken next. A one-eight-size model of the drop inlet and trash guard was built of plexiglas and brass. This model was placed in a hydraulic flume, and the testing began.

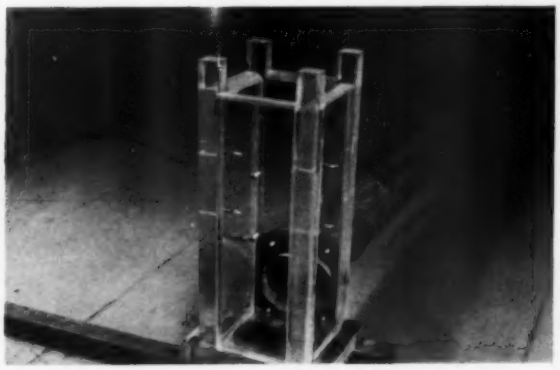
Lawn clippings introduced into the flow did not behave in the model as the hay did in the full-size structure. The clippings simply floated on the water surface and never clogged the rack bars. It was readily apparent that lawn clippings would not provide a realistic test. Hemp fibers were tried next. These behaved a little more like hay trash, but not enough. The next step was to treat the hemp fibers with dilute sulpuric acid. This made the fibers more pliant, and more important, more wettable.

After trying several different acid strengths and various durations of soaking in the acid a formula for preparing the hemp fibers was selected. The final recipe called for cutting the fibers into 1¾-inch lengths, soaking them in a 6-percent acid solution for a 3-minute period, and then rinsing thoroughly in clear water. Trash tests using this type of trash on the model spillway provided the realism desired.

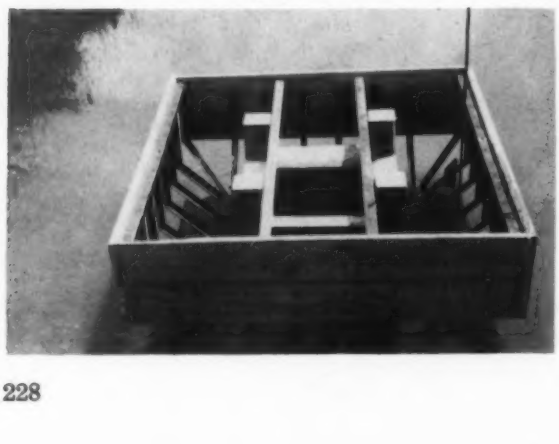
The story is best told by a series of photographs of the model and prototype at four stages of the testing.

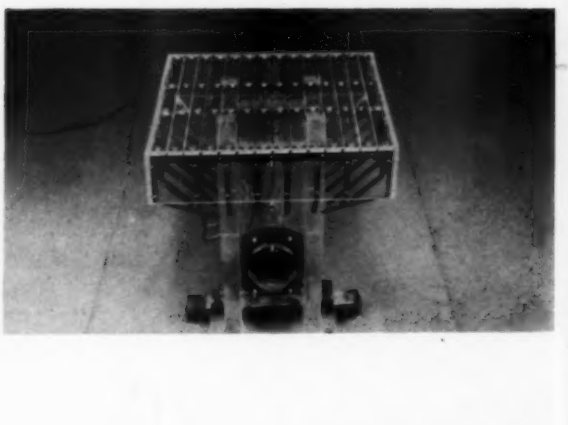


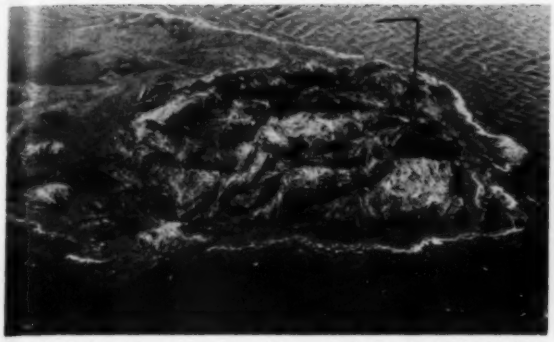
The 30-inch square inlet to a pipe spillway through a small earth-fill dam on the hydraulic laboratory grounds at Stillwater, Okla. (above) before the trash guard was installed; (below) the trash guard for the inlet, minus the top deck pieces.



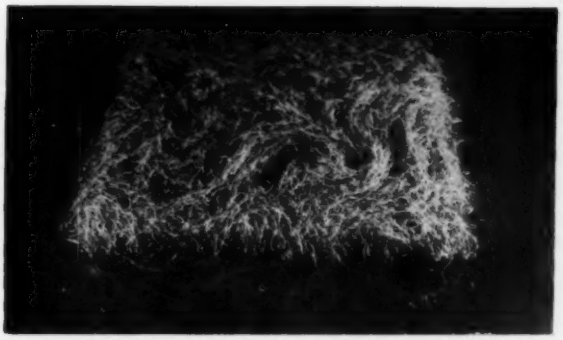
The one-eighth-size plexiglas model of the inlet to the pipe spillway on the hydraulic laboratory grounds, (above) before the model trash guard was installed, (below) after the complete trash guard was installed.







The full-size structure near the end of the trash test. Note how the hay is clogging the debris guard and preventing a full flow of water through the spillway pipe.



The model trash guard near the end of a trash test. Note that the pattern of clogging of the hemp fibers is much the same as the hay clogging of the full-size model at the left.

After the water has been drained from the pool, much of the hay trash still clings to and obstructs the trash guard of the full-size inlet.

The hemp fibers cling to and obstruct the trash guard of the indoor model in much the same way as the hay clings to the full-size model shown at the left.

These experiments have provided a technique for realistic testing of trash guard models. Now the hydraulic engineer can use trash model tests with confidence that they will predict accurately the behavior of full-size structures. It is hoped that an ideal type of trash guard will soon evolve from these tests.

Buffalo County Hits
the Watershed Trail

By Kent Alverson

BUFFALO County in western Wisconsin is taking the watershed route to conservation—all the way.

The idea of complete conservation "from ridge to river" is taught in the schools. It's talked in farm and city meetings. It's on the way to wholesale establishment on sharply sloping hillsides of this picturesque coulee country.

Elmer Steiner, chairman of the Buffalo County Soil Conservation District, says there is little doubt that within five years Buffalo County will be completely covered by watershed associations set up for the purpose of getting action started on watershed projects. And for some small watersheds of 2,000 acres or less that do not fit logical-

Note:—The author is information specialist, Soil Conservation Service, Milwaukee, Wis.

ly into an organized watershed association, partnership projects called "pooling agreements" are being used.

Dirt is now flying on six large earth-and-concrete structures that will tame runoff water in five finger-like valleys of the Alma-Mill Creek watershed.

South Nelson, a 9,000-acre drainage area, was approved for full-scale planning in March 1959, and planning was more than 90 percent complete by the end of the year. Garden Valley watershed, among the largest in the State with 121,000 acres, is expected to get planning assistance in 1960. And Beef River watershed, still larger with 140,000 acres, is in the process of organizing. This leaves only two principal watersheds to round out the county. It is interesting to note that in Garden Valley 85 percent of the landowners were signed up as watershed cooperators by committees from their association.

An example of the watershed approach on smaller projects is the Schmidt and Wicka pooling agreement in which two farmers near Fountain City pooled their resources to get the protection they needed. With financial help under the Agricultural Conservation Program and technical help from the Soil Conservation Service, they have established their principal structural measures. In cooperation with two other landowners, they are also using all the land treatment measures necessary to protect a 900-acre drainage area.

Because pooling agreements are limited to only a few that can be financed each year through cost-sharing arrangements with the county ASC committee, landowners must show that they are following or will follow a good conservation program on land under their control. The more nearly complete the protection, the stronger is their claim to priority. Structures built without needed stripcropping, cover crops, and trees in the drainage area above are usually not approved for cost-sharing.

Visitors to the Schmidt and Wicka farms have no trouble in seeing why they were able to get ASC help with their project. Standing on the highest point in the road that marks the boundary between the two farms, they can see an excellent demonstration of proper use and protection of land.

On the high outside rim of the valley is native timber, protected from grazing by any domestic animals. Farther down are long, parallel strips of corn, small grain, and alfalfa hay to act as buffers to runoff water and prevent the loss of good topsoil. And in the very bottom of the valley where gullies form most easily, structures are

Ed Wicka (left) points to conservation practices on his and Schmidt's farms as he and SCS technician Lloyd Wilbur hold his land use map.

located at strategic points to stop the gully heads in their tracks.

Upper reaches of this small watershed are under the control of landowners Len Tasterson and Ben Schollmeier. They keep nearly all of their share in permanent timber and grass. The structures are on the Schmidt and Wicka farms.

What is a control program like this worth? We have the word of Donald Schmidt, who farms the lower 300 acres. "We can't praise it enough! Eventually that ditch would have eaten right on up into my neighbor's farm—and we were losing number-one land. I wish you could have seen it before this work was done." Ed Wicka, up above, also points out the elimination of flooding damage on 30 acres of land. Protection to a highway bridge below the two farms and reduction of sediment going into the Trempeleau River are additional benefits.

Protection of the tax base to help maintain good roads is especially important in figuring the value of erosion control in watershed projects like this.

Because the watershed is small, the Schmidt-Wicka project makes an ideal demonstration for groups interested in the watershed concept. One look from a good vantage point ties everything together into a neat conservation package.

For those interested in following the story further, there is the recently completed Lost Creek project in neighboring Pepin County, and other projects in various stages of progress under the Watershed Protection and Flood Prevention Act. Lost Creek has several flood detention structures. It does not have the stabilization structures characteristic of Alma-Mill watershed, however.

The important thing is that Buffalo County folks are learning to work together for the good of the entire area. They know that conservation is only as effective as the desire, knowledge, and skill of farm operators make it; and that conservation, like religion, is only one generation from extinction.

Flood detention dam that is typical of the control structures now being planned and built in Buffalo County. The sediment pool and entrance to the draw-down pipe may be seen in the middle distance, below the spectator.

To make sure there will be a carryover of watershed interest and know-how to the next generation, directors of the Buffalo County district sponsor a conservation education program in all schools of the county. Last May 1,500 school children took tours to study conservation of water and soil. The tours were set up with a watershed theme, tracing the raindrop and the good or damage it does "from ridge to river."

In fact, the present watershed conservation interest in the county can be traced largely to the conservation education program of the past 19 years. The education program was started in 1941 by O. J. Schrwaide, county superintendent of schools and at present the secretary of the Buffalo County Soil Conservation District. It has continued ever since on a compulsory basis in all schools of the county. Some of the first recipients of this educational indoctrination are now leaders in the watershed movement.

Schrwaide says: "When I first came to Buffalo County in 1941, I found conservation teaching to be a hit-or-miss affair. One of the first things I did was to get courses started in the 7th and 8th grades in all schools. Because some of the teachers lacked the background for it, we then started putting on an institute—a short course taught by professional conservationists. Later all of our elementary teachers visited experimental farms or demonstration areas on conservation. Now, we follow up the classroom teaching with the conservation tours so all the pupils can see the practical way these things fit in."

It may be that the well-defined drainage patterns and publicity given to Lost Creek watershed in neighboring Pepin County have also given a special boost. Whatever the reasons, Buffalo County as of now lays claim to being the most watershed-conscious county in the State of Wisconsin.

Teams of Grasses

—for the Southeast

By Paul Tabor

MANY farmers of the Southeast are now using teams of grasses for their farms. They are finding that no one grass can adequately fill all their forage and conservation needs.

The "one best grass" argument started about 200 years ago with the introduction of orchardgrass into Virginia and bermudagrass into Georgia. A few years later bluegrass began to dominate the rich limestone grazing lands of Virginia, Kentucky, and Tennessee. About a century ago Johnsongrass made hayfields of many rich cotton and corn farms on the river bottoms and black belt soils, while Dallisgrass spread over the permanent pastures of this area. Carpetgrass came into the damp, sandy pastures of the Deep South about 1910. Yet, the one-grass economy continued on most farms of the Southeast until the last two decades, except where such invaders as Johnsongrass and Dallisgrass encroached.

The teaming up of farm grasses during the past 20 years followed the resurrection of two old grasses, rescue and tall fescue, and the introduction of three new ones, Coastal Bermuda, Pensacola Bahia, and Pangola. These five were farm tested extensively during the 1940's. Each had admirers ready to praise its virtues, overlook its faults, and sell seed or sprigs at a high price. A few years of increase brought the prices down and the experience gained enabled farmers to estimate the real value of each. They had guidance and help from the SCS and other agricultural agencies in doing so.

A grass team common in the deep, deep South, the peninsula of Florida, is Pangola and Pensacola Bahia. The former endures more water, more alkalinity and uses heavy doses of commercial fertilizers efficiently. The latter is superior on poorer soils, survives imperfect management splendidly, and endures light-to-medium frosts better.

Dick Kelley, manager of the Monreve Ranch at Stuart, Fla., says: "I wouldn't want to be in the cattle business down here with just Pensacola Bahia. It is not as palatable as Pangola where you have clover. But I will say this much for Pensacola Bahia, I have blocks of it on land not fertilized for three or four years and can use it like range for wintering cows and they come off in good shape."

Farther north and across the State at Chiefland, W. E. Beasley, with 500 acres of Pensacola Bahia and 90 of Pangola, reported, "You need Pangola." He uses the Pangola for hay in summer, refertilizes and saves the late growth for winter grazing. The Pensacola Bahia is used for pasture and in rotation with row crops.

Coastal Bermuda replaces Pangola in the team near the upper boundary of Florida and continues in a humid belt about 1,000 miles long east and west and 200 miles wide. It is the glamour grass for

Note:—The author is plant materials specialist, Soil Conservation Service, Athens, Ga.

Pangola grass is an important member of grass teams for the deep, deep Southeast because of its high production and palatability when grown on fertile soils.

this area, performing splendidly on well-drained, highly fertilized soils. It endures local droughts perfectly, but languishes on ordinary soils with limited fertilization and on wet areas. It is used for both grazing and hay. Richard Meyer, a grassland farmer near Savannah, Georgia, told the writer, "My basic grazing is Pensacola Bahiagrass and crimson clover, but my hay is mainly Coastal Bermuda. I grow reseeding crimson clover with both grasses. I can combine seed of the clover on the Bahia, but have difficulty on the Coastal because the grass stems overgrow the clover heads."

Henry Blitch of Statesboro, Georgia, a general farmer with a strong leaning to livestock, started with Coastal Bermuda and developed 110 acres. Later, Pensacola Bahia was planted in other pastures and increased to 74 acres. Mr. Blitch said, "I like both grasses. It's easier for me to manage the Bahia for good quality grazing. The Bahia has been mighty good on rather wet land, and also on deep sand ridges. A full sod keeps down weeds. The Coastal Bermuda sometimes gets too high before I know it during a busy crop season. I graze the Coastal Bermuda until June or July, then leave it for hay. If I want extra yields, I apply more nitrogen. It out-yields Bahia when heavily fertilized and grows better on droughty land when rains are scarce."

Coastal Bermuda is an important member of most grass teams in the deep Southeast because of its high production on fertile soils. It produces excellent hay, as above, or provides superior pasture, as below, when properly cared for.

Pensacola bahia is an important member of most grass teams in the deep Southeast because of its ability to produce good pasture on the poorer soils and withstand imperfect management.

Byron Cobb, Donalsonville, Georgia, has about 100 acres of Coastal Bermuda for grazing and hay and 200 acres of Pensacola Bahia for seed and soil improvement in a grass-based rotation. He said, "I'll keep Pensacola Bahia as long as seed sells for 10¢ a pound or more."

In southeastern Alabama, the acreage of Pensacola Bahia leads

Pensacola bahiagrass is an excellent grass to use in sod-based rotations throughout the Southeast.

Coastal Bermuda by a 6-to-1 ratio. A father-son partneship, that of Edgar G. and Melborn Ivey, near Webb, Ala., has 100 acres of Coastal Bermuda and 50 acres of Pensacola Bahia. "The Bahia is mighty good on wet low grounds and on stumpy new ground," observed the father. "We like Coastal Bermuda," said the son, "because we can put on more fertilizer and get more grazing and hay if we need it." The Iveys have one field of Coastal Bermuda and Pensacola Bahia intimately mixed. Farmers have been warned to keep Bahia out of Coastal Bermuda fields, but here they are both thriving together. Similar mixtures have been reported in southeastern Georgia where fields planted to either grass resulted in partial failures and were replanted with the other. This mixture may be good for grazing, but not for commercial hay.

In the Midsouth the farm grass team may exceed a basketball team in number of players. There tall fescue, rescue, and Kentucky bluegrass reach their practical southern limits and Pensacola Bahia, Dallis, and Coastal Bermuda approach their northern limits. An example is found on the farm of J. C. Richter, Madison, Georgia, with Coastal and Common Bermuda, Pensacola Bahia, Dallis, tall fescue, and Kentucky bluegrass. He observed recently, "I consider Common Bermuda, Bahia, and Dallis short-season grasses that are good in their period of growth but may be cut short by drought. I am planting more Coastal Bermuda for grazing and hay. I like Kentucky bluegrass for cool-season grazing. If I had to use one grass only it would be fescue."

A lot of other farmers in the hills and valleys of the upper Cotton Belt agree with Mr. Richter. If fescue is given adequate amounts of commercial fertilizer or chicken manure it covers the fields with a soil-conserving blanket of green and furnishes grazing when needed most. Sometimes the forage value is low. The cause has not been determined. Research workers in this country are searching for a toxic compound in the plant.

Tall fescue is a basic plant in most grass teams for the upper Southeast.

R. Jarrige of France reported in 1954 that Kentucky fescue forage in the spring had about half the sugar content of Italian ryegrass. The Georgia Experiment Stations in 1956 reported greatly increased beef gains by supplementing tall fescue grazing with ground whole ear corn but almost no increase by using this supplement on ryegrass grazing. Perhaps a supplement of quickly available carbohydrate and close grazing during the active growing period will correct the nutritional deficiency of tall fescue.

Using other grasses for part of the grazing may be equally effective. A mixture of orchardgrass and tall fescue is used by many farmers in the upper part of the Southeast. Below the orchardgrass belt temporary winter grazing of small grain with or without ryegrass and crimson clover or of rescue grass is used by some to improve the nutritional efficiency of the tall fescue.

Fertilizing pine trees proves profitable

Finding the value of fertilizing forest and Christmas trees is the object of experiments conducted by Ohio and Michigan researchers. The experimenters report that fertilizer applications to red pine growing on poor soil improved the trees.

Red pine, an important reforestation species in the Lake States, showed better color and needle weight and length the first season after fertilization. Various rates of 12-12-12 and 12-6-12 fertilizers were used, with the former giving superior results.

The experimenters say the improvement in the trees was due mainly to nitrogen, a nutrient in which the humus-poor soils were extremely deficient, but that the addition of the complete fertilizer improved the production of wood tissue and resistance to insect attack.

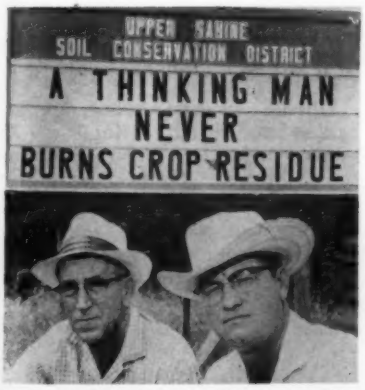
Signs of the Times

By Charles B. Hildebrand

TWO large signboards, 5 x 10 feet, located at the east and west approaches to Commerce, Texas, give timely hints to cooperators of the Upper Sabine Soil Conservation District and to other interested farmers. The signs also create considerable interest in soil conservation among motorists of all classes.

The signboards were donated to the district by a local feed store owner. Messages are changed on the signs every month.

During the early summer, when grain growers were tempted to burn straw and stubble from their wheat and oat fields, the signs looked like this:



Wade McWhirter, SCD supervisor (left) and H. R. Freels, feed-store owner, in front of a district signboard.

As a result, few—if any—grain patches in the vicinity were burned. Many farmers needed only to be reminded that "Thinking men" never destroy this humus-producing material that gives life to the soil. Others refrained from burning because they did not wish to be stigmatized as "Un-thinking men."

Terrace construction took a boost in the months following the appearance of this sign:

Many of the phrases or slogans are thought up by members of the district board of supervisors and the SCS staff that works with the district. Some are suggested by district cooperators or other interested conservationists.

Late last summer, with planting time for winter legumes just ahead, the motoring farm populace was greeted by this sign:

The supervisors of the Upper Sabine district are highly pleased with the results obtained from their signboards. Favorable comments on the part of farmers and the general public are frequent. And, more important, they think these timely suggestions are getting more soil and water conservation applied to the land. Furthermore, the signboards help keep the name of the district and its mission before the motoring public.

Note:—The author is work unit conservationist, Soil Conservation Service, Commerce, Tex.

A New Look and a New Story

By J. L. Knight

DILAPIDATED buildings, sheet and gully erosion, and other signs of neglect challenged J. T. Coffman and his wife when they bought a 202-acre farm in Carroll County, Tennessee. That was 8 years ago, in 1952.

The farm now has a new look and a new story. A modern home and a new barn have been built. Conservation practices cover the fields. Thrifty cattle and hogs graze contentedly in green fields fenced with woven wire and multiflora rose "living fences."

Before the Coffmans purchased the farm, they consulted several agricultural agencies, including Farmers Home Administration, Soil Conservation Service, and their county agent. They found that soil types on the farm were Memphis and Lexington silty clay loams. These are naturally productive soils that respond to good treatment. Good land use practices could be installed and maintained. A number of enterprises could be supported.

The Coffmans were assured that credit was available to develop the resources. They became cooperators with the Carroll County Soil Conservation District soon after they bought the farm.

Farming operations are based on a livestock program of beef cattle and hogs. The beef enterprise is

Note:—The author is work unit conservationist, Soil Conservation Service, Huntingdon, Tenn.

Brown Aden, Supervisor of the Carroll County Soil Conservation District, (left) presents a savings bond to Mr. and Mrs. J. T. Coffman as winners of the Save-Enrich Our Soil Contest in the Carroll district.

a cow-calf-feeder program. The swine enterpise consists of farrowing and feeding out about 100 top hogs to a weight of 225 lbs. each year. The land use program is designed to support the livestock program.

A number of conservation crop rotations are used. Small grain, button clover, and alfalfa are used extensively in the rotations. These rotations are major factors in bringing about the increased crop yields, according to Coffman. His corn yields have increased from 30 to 110 bushels per acre, wheat from 18 to 31 bushels, and oats from 30 to 70 bushels. With bumper yields, more land can be diverted to permanent or rotation pasture.

Natural draws in the cultivated fields have been shaped and seeded to fescue and white clover to form grass waterways. Old terraces, no longer used, have been destroyed. Contour stripcropping has been established on 50 acres.

The permanent pastures are mainly fescue and clover or orchardgrass and clover. These are supplemented by a 15-acre field of kudzu, and a 12-acre field of bermudagrass for summer grazing. Also, small grains and button clover are used for fall and early spring grazing. Water shortage and fence location problems were solved by building two farm ponds. New fences have been established on the contour.

Coffman planned originally to clear a 35-acre woodland area and establish pasture on it. But he changed his mind. "I took a pencil and a piece of paper and did some figuring," he stated, "and the figures showed me that I could make more money by leaving it in woodland than if I cleared it and converted it to pasture."

"It has not been easy to stay on the farm," Coffman continued. "When farm income continues to show a loss over a period of years, it takes willpower and a love for the land to keep going. We did not get in the black until 1958. One reason we finally made it was because the farm plan built around the basic principle of soil and water conservation was flexible."

The struggle has not been without reward. Coffman was county winner in the Save-Enrich Our Soil Contest in 1957 for the Memphis trade area, and runner-up in the State contest. He received the outstanding farmer of the year award in 1958 from the Huntingdon Rotary Club. And neighbors have installed conservation practices, such as contour stripcropping, after seeing the practices demonstrated on this rejuvenated farm.

His greatest reward, in his own words, is "the satisfaction of having a job well done." He has his farm tied down with sod crops and other soil and water conservation practices. His soil will now stay at home where it will benefit him and his family, his community, and the nation.

◆

Banker's awards to New Mexico farmers

During 1959, 12 New Mexico banks handed out a total of 77 awards to farmers and ranchers in the State for their outstanding work in conservation.

More than 500 New Mexico agricultural producers have won these awards during the past decade. They are bestowed in cooperation with the New Mexico Association of Soil Conservation Districts.

The inscription on these awards reads: "He has shown his love for the land by using it properly and establishing the necessary conservation practices, thereby maintaining the fertility and increasing the productivity of his farm. He has proven himself to be a good steward by preserving his farm for generations to come. It is in recognition of an important task well performed that he and his family are awarded this testimonial of honor."

Conservation planning brings—

Recovery for a Sandyland Range

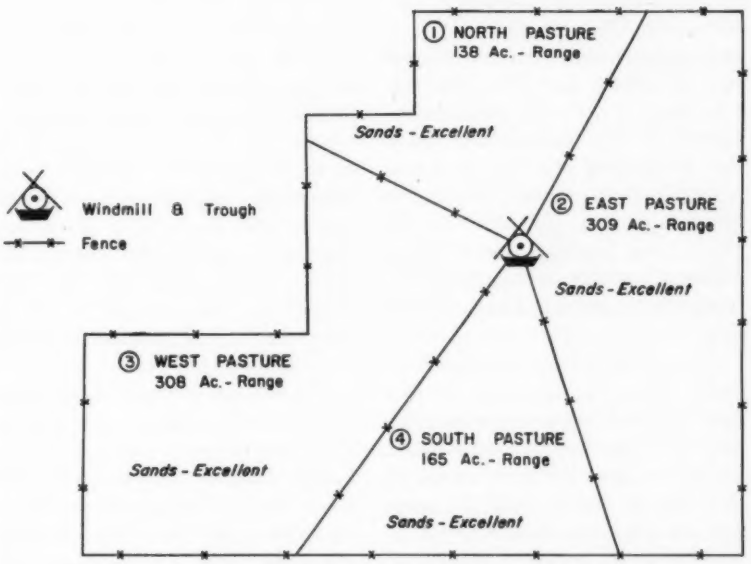
in southwestern Kansas

By Kelso Williams and
P. N. Jensen

THE 920 acres of sandy rangeland southeast of Meade, Kans., didn't appear to be worth much when Carl Merkle took possession of it in 1953. The tall-growing grasses that once flourished on the hills were gone. In their stead were sand sagebrush and other undesirable shrubs and annuals. There were places with no vegetation at all, where wind and water erosion had done their worst.

Merkle, already a cooperator with the Meade County Soil Conservation District, went to see the Soil Conservation Service men assigned to the district. He wanted to talk about a conservation ranch plan. The SCS men were delighted to cooperate.

Note:—The authors are, respectively, work unit conservationist, Meade, Kans., and range conservationist, Dodge City, Kans., both of the Soil Conservation Service.



Land use and conservation map of the 920-acre Merkle range.

With the SCS men giving him the information he needed on his soil and range resources, Merkle set about developing his conservation plan.

He decided that overseeding the depleted rangeland was essential. Cross-fencing for livestock management would be needed, and of course he would have to provide for proper use of the key native grasses.

By the end of 1957, Merkle had seeded 600 acres of the sandy rangeland. The mixture he used mainly was one of native grasses like those that once grew so vigorously in the area—sand and little bluestem, switchgrass, and blue grama. Merkle added a little sand lovegrass to the mixture for good measure.

The plan called for resting the newly planted grasses for at least two years to give them a better chance. It was hard to find the

Carl Merkle (left) and Kelso Williams in one of the reseeded pastures on Merkle's range.

young plants the first year, but by the end of the second season Merkle could find seedlings almost everywhere.

Merkle completed the cross-fencing on schedule. In 1958, he divided the original pasture into two pastures. In 1959, he divided these two pastures again. This way he could rotate the use of the pastures.

Resting a pasture, Merkle explains, is like summer fallowing. You are storing grass for later use.

Merkle now stocks the ranch from April 1 to November 1. He begins each grazing season with a different pasture, giving the other pastures the benefit of early-season rest.

He watches the grazing carefully. When the grass in one pasture has had enough grazing, the cattle are taken to another pasture. He makes sure there is enough of the grazed plants left to make prompt and vigorous recovery.

Merkle can see real results already from planning and carrying out a soil and water conservation program. There is more grass, and of better quality. Erosion is being reduced.

Carl Merkle winters his calves on his other ranch unit in Meade County, so the keeping of accurate records on weight gains from this unit is impractical. He is sure, however, that his work is paying off in heavier calves at weaning. Calves dropped in the winter go to the other place in November weighing at least 500 pounds. He says the calves are now at least 50 pounds heavier than when he first started using this range.

Merkle gives a lot of credit to the sound soil and water conservation plan he developed with SCS help. The plan put all the needed treatment down in black and white and scheduled it according to his means and time.

New Reservoir— New Ranch

By Leon Hubbard

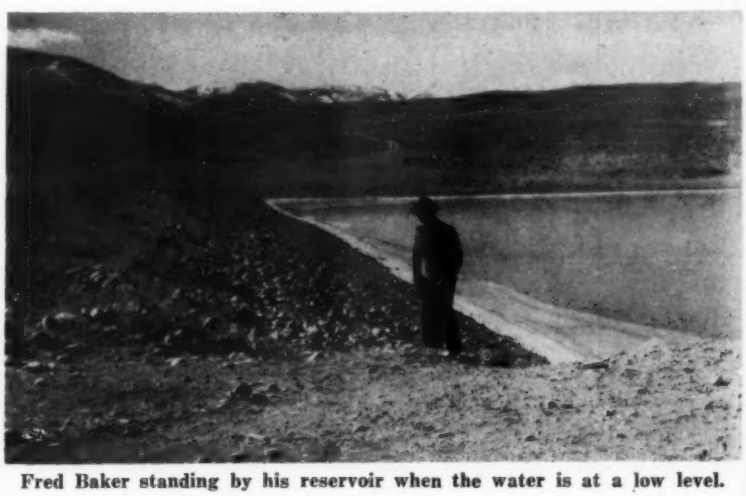
"A reservoir has been the most important single achievement in the development of my conservation program," declares Fred Baker, who operates a large cattle ranch on the east edge of the White Pine Soil Conservation District, 60 miles west of Ely, Nevada. He bought this ranch about six years ago when he moved from Delta, Utah.

"About all I bought was some acreage and a good water right; it was just an old, rundown ranch," Baker declares. "In June, we had more water than we knew what to do with; the rest of the summer the stream would be so low that we couldn't accomplish much with it. The land was almost impossible to irrigate because it was so uneven, and a considerable amount was taken up with old weed-bound ditches. Another thing that caused trouble was the lack of correct slope on the ditches. Some of them had cut gullies down to five or six feet deep. The land had been in hay without rotation for so many years that the stands were thin and invaded by weeds."

Fred is an old hand at getting conservation work accomplished, having done an outstanding conservation job on his land in Utah. He had been a soil conservation district cooperator there for many years. It was only natural that the first thing he did after moving to Nevada was to become a cooperator of the White Pine district and develop a conservation plan. First on his agenda was the construction of a reservoir for water storage.

After the designs were furnished

Note:—The author is soil conservationist, Soil Conservation Service, Ely, Nevada.



Fred Baker standing by his reservoir when the water is at a low level.

Fred Baker works on a concrete collar for the pipe spillway of his reservoir.

by Soil Conservation Service technicians from Ely and approved by the Nevada State Engineer's Office, Baker had the contractors begin in the spring of 1955. About three months later his first big reservoir was completed. The dam is 30 feet high and 720 feet long. It contains 40,000 cubic yards of fill and stores 130 acre-feet of valuable water.

The reservoir storage gives him one additional irrigation for the entire ranch and has completely stopped the gullying action of uncontrolled water in the old channel. Baker now can irrigate with the stream of water he needs rather than with what the creek happens to be supplying at the time. No longer is the high water in June (sometimes as much as 40-60 feet per second) unmanageable as in the past.

The reservoir gets a lot of heavy use by fishermen. A neighbor remarked: "It's a regular playground, and one of the few places around these parts where you can catch three-pound trout. In the winter when the water is frozen you'll see skating parties out there every night playing hockey and having a big time."

Since 1955, Fred has moved well along the way to completion of his conservation plan. He has leveled 170 acres, most of his ditch system has been rebuilt to a uniform grade, a crop rotation system is being applied, commercial fertilizers have been used extensively, and his ranch is becoming a showplace of conservation accomplishments.

Last year, Fred harvested 9,000 bales of alfalfa-grass hay as compared to 600 in 1954. "This is evidence enough that conservation does pay off," he points out.

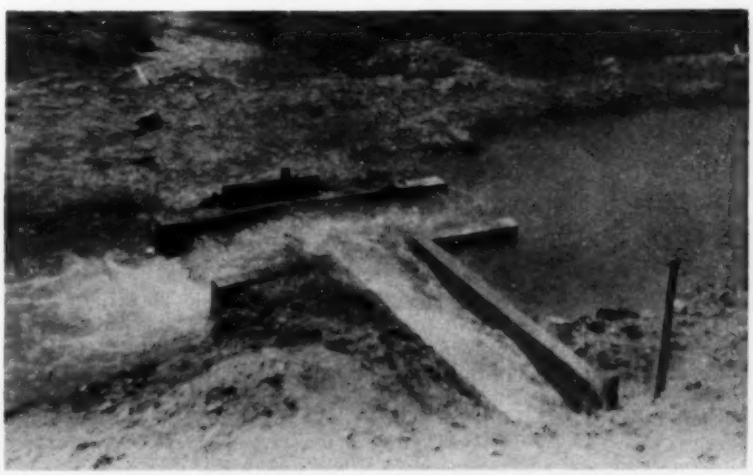
In 1956, a new snow course was established on Mt. Moriah, the watershed that supplies Baker's Silver Creek Ranch with water. Fred has taken an active interest in these snow measurements, and goes up with the snow surveyors every year to help with the measurements. In this way he is keeping an eye on the source as well as the ultimate use of his water.

Along with his ranch improvements, Fred has not overlooked his range resources. He recently was granted a range allotment that includes 60 sections of public land. He already has built several stockwater reservoirs on this rangeland and has piped water 2¼ miles from the mountains to get better distribution of grazing. He intends to fence this entire area and institute a rotation-deferred grazing system of management.

"This range has been 'grazed in common' long enough, and I intend to see that it not only holds its own, but also improves every year," Baker declares.

He recognizes the need for a complete conservation job and plans to continue with his program until all the problems are solved.

"I'm going to pipe the water from my reservoir down to the lower fields because we are losing water in that open ditch. We're going ahead with the concrete work on the diversion outlets above the dam, and plan to build cement headgates and outlets throughout the entire irrigation system. It's only good business. I'm going to convert the alfalfa fields upstream from the reservoir to improved pastures. The soils are shallow and



Outlet structure from Fred Baker's reservoir that carries about 20 cubic feet of water per second to irrigation ditches.

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take more frequent irrigation but the excess water returns to the creek and back into the reservoir, so in this way I feel we will get double use out of some of the water. And I will need the extra summer feed as my herd increases."

"Then I intend to clear the brush and weeds on those meadowlands way above my upper fields, and seed them to crested wheatgrass. I'm getting a little more of the job done every year, and will continue until I'm satisfied we have all the improvements needed," he concluded.

Fred Baker is sold on the idea that the ranch will return profits only when it's properly managed and all of the conservation needs are taken care of. His ranch today is proof that the fruits of his labors are being returned to him manyfold.

Weed Killers Tested in Illinois

Some new pre-emergence weed control chemicals tested by University of Illinois agronomists during 1959 produced favorable results.

According to F. W. Slife the new compounds Amiben, Atrazine, Randox-T, and Falone gave results comparable with those of older materials. He states, however, that several more years of testing will be needed to determine whether these new chemicals can be used to better advantage than Simazine, Randox, 2,4-D, and Alanap.

In the tests Eptam injured some corn, and it is not recommended for general control of weeds in this crop. But it can be used successfully for wild cane and johnsongrass seedlings.

Both Simazine and Atrazine will control all annual weeds. Since Atrazine dissolves more quickly in water, it may perform better than Simazine in dry years. Both are recommended for pre-emergence control of weeds in corn. Slife warned, however, that these chemicals may reduce growth of spring grains following corn unless the soil is plowed or disked in the fall.

Randox and Randox-T performed well in the tests. Randox is recommended for corn and soybeans where grasses are the major problem. Randox-T is suggested for trial use in corn only to control grass and broadleaf weeds.

Alanap controlled weeds in soybeans, although in a few cases it stunted the beans early in the season. This chemical is recommended for controlling weeds in soybeans. It works especially well on broadleaf weeds except smartweed.

Both liquid and granular 2,4-D were effective in controlling weeds in corn when used as a pre-emergence treatment, but some crop damage and loss of stand occurred.

Granular herbicides will be widely available in 1960, Slife reported. Tests to date show that they perform as well as the liquid forms. But because costs may run slightly higher per acre, a farmer should make sure that the extra cost will be offset by the extra convenience in handling before he changes all of his equipment to use granules.

Outwitting the Ducks

Nolan Rauton, a cooperator with the Greenwood Soil Conservation District in South Carolina, started a program six years ago to outwit the ducks. He wanted to attract the ducks to his farm and keep them there long enough to get in some good hunting.

So, with SCS technical aid, he built two ponds on his 350-acre farm near Lake Greenwood. He planted the banks of the lower pond to browntopmillet.

The millet brought the ducks to the ponds and held them. Now he has homemade duck hunting.

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Soil testing is as much of a requirement for efficient farm management today as the use of tractors, fertilizer, pesticides, milking machines, or record books, according to Delno Knudsen, University of Nebraska extension agronomist. Knudsen points out that the soil test is "the farmer's way of taking inventory of the plant nutrients in his soil. No smart merchant can stay in business unless he keeps a well-filled stock of essential items on his shelves."

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It takes the average factory worker in the United States about half as long to earn enough to pay his family grocery bill as it did 30 years ago.

He now works a week out of every month to buy food for a family of four. Back in the 1920's he worked two weeks to buy that food.